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HOW TO FORETELL OUTBREAKS OF THE PALE WESTERN CUTWORM IN THE PRAIRIE PROVINCES

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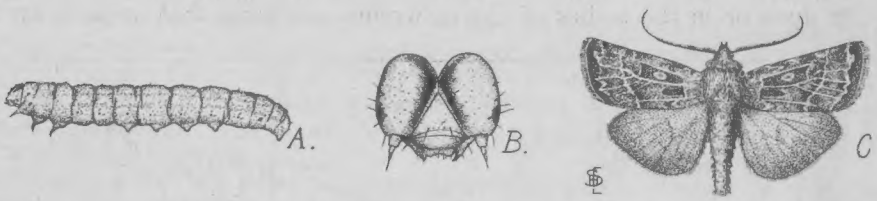

A—Full grown cutworm;
B—Head of cutworm enlarged;
C—Moth of Pale Western Cutworm.
A and B natural size; (after Seamans and Strickland).

THE Pale Western Cutworm, *Porosagrotis orthogonia* Morrison, has been causing serious losses to grain crops in the southern sections of Alberta and Saskatchewan for several years. During the past few years it has been responsible for an average yearly loss of fully three million dollars worth of grain. In some sections it has appeared and disappeared at varying intervals so that farmers are at a loss to know when to expect this pest in outbreak form. In an effort to assist farmers in forecasting outbreaks this circular has been prepared.

The Pale Western Cutworm is a common prairie pest. In the years before wheat was raised in quantity it fed probably normally above ground on blades of grass and lived for the greater part of its larval life on the soil surface. Insect enemies in the form of parasites and predators were able to reach the larvæ and thus hold the species in control so that no outbreak occurred. With the cultivation of land for crop this species began a subterranean form of existence. Now, the cutworms during the period of activity, in May and June, feed almost entirely underground, eating only the very tender portions of the grain plants about an inch below the surface of the soil. They are thus protected against their insect enemies. The only time when these cutworms come above the surface is when the soil is wet, following a moderately heavy rain or during irrigation. The insect enemies which have managed to subsist on other surface-feeding species of cutworms or other caterpillars, thus, have a very brief oppor-

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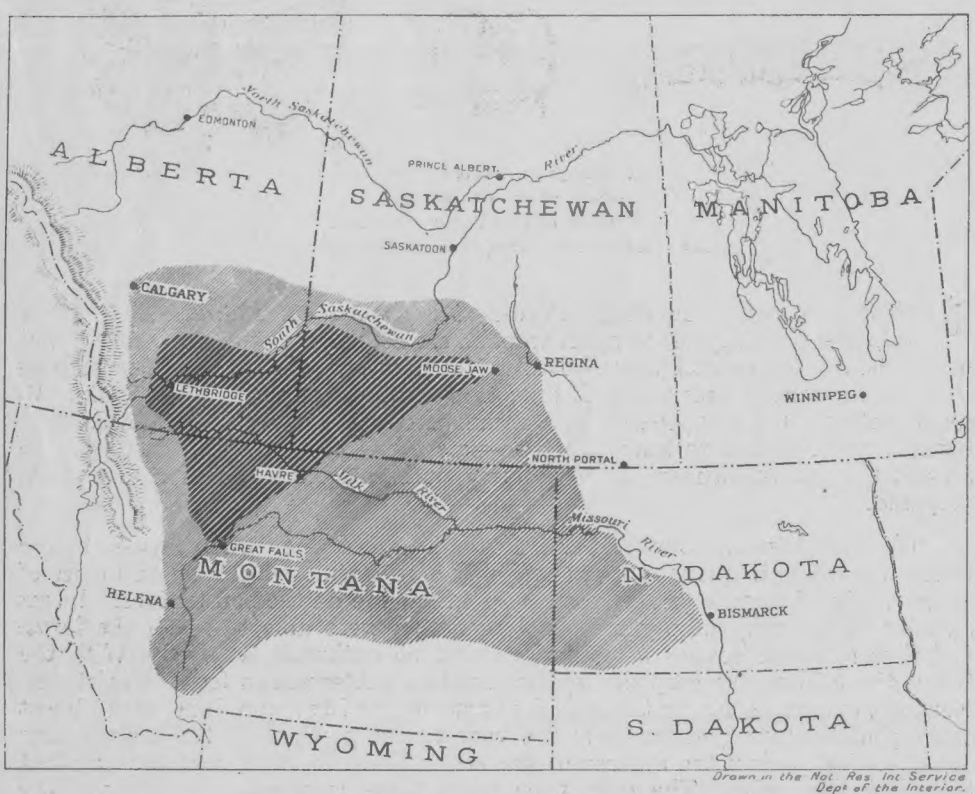
tunity to reach the Pale Western Cutworms and it would appear that this opportunity is limited very largely by the amount of rain that falls during the months of May and June. Herein, therefore, do we find a method of forecasting outbreaks of this cutworm.

The reaction of the larvæ to moisture is remarkably rapid; the cutworms often coming to the surface in half an hour following a heavy rain of a quarter of an inch and remaining on the soil surface for several days after a spell of wet weather. During wet weather the larvæ often cut the stems of the plants above ground and feed on the leaves or if there is a moderate amount of moisture in the soil they cut the stalk below ground as usual and pull the entire plant below the surface while feeding on it.

In general there are two main kinds of parasites; those that lay their eggs directly upon or in the bodies of the cutworms and those that oviposit on the



Map showing distribution of the Pale Western Cutworm
darkened portion being area of heaviest infestation.

foliage of the plants and the eggs are ingested in the process of larval feeding. The value of these parasites in the control of the Pale Western Cutworm is thus plainly limited by the amount of rainfall.

A study of the rainfall records shows that there is a distinct relationship between the number of days in May and June with sufficient moisture to bring the cutworms to the surface and the abundance of cutworms the following year. A comparatively accurate and reliable estimate of cutworm prevalence could be made by any farmer by checking the number of wet days on his calendar and computing, at the end of June, the total number of days when it may reasonably be expected the Pale Western Cutworms were moving about on the surface of the soil during the two months.

If there are less than ten such days it is probable that there will be an increase in the number of cutworms the following year.

If there are between ten and fifteen such days there will, in all probability, be some decrease in the number of cutworms the following year.

If there are more than fifteen such days little trouble may be looked for from this insect.

The amount of rainfall required to bring the cutworms to the surface, and the length of time they remain there depends a great deal on the condition and type of the soil. Heavy soils require more moisture to bring the cutworms up unless the soil is already pretty well soaked and in that case they will remain on the surface for a greater length of time. Wet days might best be considered days when it is inadvisable to use a disc in the field.

This method of forecasting should be used in conjunction with the following cultural control measures, which are explained in Crop Protection Leaflet No. 15 of the Dominion Entomological Branch, copies of which may be obtained either from the Dominion Entomological Laboratories at Lethbridge, Alberta; Saskatoon, Saskatchewan; Treesbank, Manitoba; or from the office of the Dominion Entomologist, Ottawa.

" Fields which are to be summer-fallowed must be worked early, and should be thoroughly cultivated during June and July in order to germinate all weed seeds, and to destroy the weeds. *All work must be stopped by the 1st of August and the field left entirely alone until September 15.* If the field be quite clean by the end of July any weeds that germinate later will not reach the flowering stage in time to attract the moths as a feeding ground.

" The most important thing, however, is that any light shower will tend to cake the surface of the soil and to seal up the cracks around clods. This will destroy all hiding places for the moths and the caked surface will not be attractive to them for egg-laying.

" If a fall grain crop is to be sown, such as fall rye or wheat, it is advisable to have the crop in by August 1, rather than to invite the moths to lay their eggs in the soil by working it between August 1 and September 15, which is the critical period with the cutworm, during which the land should be disturbed as little as possible.

" An unusually thorough late fall ploughing, seven or eight inches deep, followed by packing, undoubtedly buries the eggs so deeply that some of the ' worms ' will not reach the surface of the ground.

" When a field, which is suspected of having cutworm eggs present, is to be seeded to a spring crop a saving can be made by sowing a single drill-width diagonally across it as early as possible. If the grain comes up and shows no signs of cutworm injury it is safe to seed the entire field. If, however, the grain is destroyed, the field should not be seeded until the worms have stopped feeding. While this may tend to make crops a little late, it will save a great loss from seeding badly infested fields. "

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